

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Kuderer et al.

SERIAL NO.: Unassigned

EXAMINER: Unassigned

FILED: Herewith

GROUP NO.: Unassigned

TITLE: METHOD OF REDUCING THE EFFECTS OF VARYING
ENVIRONMENTAL CONDITIONS IN A MEASURING INSTRUMENT
AND MEASURING INSTRUMENT USING THE METHOD

ATTORNEY DOCKET NO. US20003799

Assistant Commissioner For Patents

Washington, D.C. 20231

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Name

Allison Berkman
Signature

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the application as follows:

IN THE DRAWINGS

Please amend the drawings by adding the designation --Prior Art-- to Figure 1 as
shown in red on the attached copy of Figure 1.

IN THE SPECIFICATION

On page 21, after the word "Abstract" insert --OF THE DISCLOSURE--.

Please replace the present Abstract of the Disclosure with the following paragraph:

A method of reducing the effects of varying environmental conditions on a
measuring instrument includes thermally insulating a measuring unit such that the
effects of variations of environmental conditions on selected components of the
measuring unit are substantially reduced, while allowing dissipated heat generated

within the measuring unit to leave the measuring unit. The method also includes controlling a first temperature in the measuring unit by means of a control loop which includes a temperature sensor and means to influence the first temperature in the measuring unit in such a way that temperatures at locations with selected components are kept substantially constant.

IN THE CLAIMS

1. (Amended) A method of reducing the effects of varying environmental conditions on a measuring instrument comprising a measuring unit, said method comprising:

thermally insulating said measuring unit such that the effects of variations of environmental conditions on selected components of said measuring unit are substantially reduced, while allowing dissipated heat generated within said measuring unit to leave said measuring unit ; and

controlling a first temperature in said measuring unit by means of a control loop comprising a temperature sensor and means to influence said first temperature in said measuring unit in such a way that temperatures at locations with selected components are kept substantially constant.

2. (Amended) Method as in claim 1, wherein said step of thermally insulating comprises arranging a thermal barrier between said measuring unit and a housing of said measuring instrument.

3. (Amended) Method as in claim 1, wherein said first temperature in said measuring unit is related to an ambient temperature and wherein said first temperature is controlled within a range of the order of the expected variation of the ambient temperature.

4. (Amended) Method as in claim 3, wherein said first temperature in said measuring unit is above said ambient temperature.

5. (Amended) Method as in claim 1, wherein said step of controlling a first temperature comprises:

directing air to said measuring unit utilizing a fan;

heating said air directed to said measuring unit; and

measuring the temperature of said heated air and using said measured temperature as an input signal to said control loop.

6. (Amended) Method as in claim 5, comprising the additional steps of:

measuring a temperature ($T_{1 \text{ amb}}$) close to said housing where ambient air enters said measuring instrument; and

deriving from said temperature ($T_{1 \text{ amb}}$) an additional input signal to said control loop.

7. (Amended) Method as in claim 1, wherein said measuring instrument comprises a liquid chromatography detector.

8. (Amended) A measuring instrument comprising a measuring unit comprising components which are sensitive to varying environmental conditions, said measuring instrument comprising:

thermal insulation arranged in said measuring instrument so as to substantially reduces the effects of said variations in environmental conditions on selected components, and to permit dissipated heat generated within said measuring unit to leave said measuring unit ; and

a controller for controlling a first temperature in said measuring unit, said controller comprising:

a temperature sensor; and

means to influence said first temperature in such a way that temperatures at locations with said selected components are kept substantially constant.

9. (Amended) Measuring instrument as in claim 8, wherein said thermal insulation comprises a thermal barrier arranged between said measuring unit and a housing of said measuring instrument.

10. (Amended) Measuring instrument as in claim 8, wherein said controller comprises:

a fan for directing air to said measuring unit;

a heater for heating said directed air;

a temperature sensor for measuring a temperature of said heated air; and

a control loop connected to said temperature sensor and to said heater.

11. (Amended) Measuring instrument as in claim 10, further comprising an additional temperature sensor located in close proximity to said housing where ambient air enters said measuring instrument, and wherein said additional temperature sensor provides an additional input signal to said control loop.

12. (Amended) Measuring instrument as in claim 8, wherein said measuring unit comprises :

a flow cell through which solvent can flow; and

additional means for adapting a solvent inlet temperature to a temperature of the flow cell environment.

Please add the following new claims:

13. (Newly added) Method as in claim 3, wherein said first temperature is above said ambient temperature by about one half of said expected variation of said ambient temperature.

14. (Newly added) Method as in claim 1, wherein said measuring instrument comprises a liquid chromatography absorbance detector.

Remarks

Claims 1-12 remain in the application and claims 13-15 are newly added.

Claims 1-12 have been amended to eliminate drawing designations and unnecessary phrases and lettering.


Claims 4, 7, and 8 have been amended to eliminate features claimed in the alternative.

Claims 13, 14, and 15 are newly added to claim those features originally claimed in the alternative in claims 4, 7, and 8, respectively.

Claims 1-12 have been clarified by amendment for purposes of form. It is respectfully submitted that the amendments to claims 1-12 are neither narrowing nor made for substantial reasons related to patentability as defined by the Court of Appeals for the Federal Circuit (CAFC) in Festo Corporation v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 95-1066 (Fed. Cir. 2000). Therefore, the amendments to claims 1-12 do not create prosecution history estoppel and, as such, the doctrine of equivalents is available for all of the elements of claim 1-12.

Attached hereto is a marked up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version With Markings to Show Changes Made."

Respectfully submitted,



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6-12-01

Date

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

On page 21, after the word "Abstract" insert --OF THE DISCLOSURE--.

Please replace the present Abstract of the Disclosure with the following paragraph:

A method of reducing the effects of varying environmental conditions on a measuring instrument includes thermally insulating a measuring unit such that the effects of variations of environmental conditions on selected components of the measuring unit are substantially reduced, while allowing dissipated heat generated within the measuring unit to leave the measuring unit. The method also includes controlling a first temperature in the measuring unit by means of a control loop which includes a temperature sensor and means to influence the first temperature in the measuring unit in such a way that temperatures at locations with selected components are kept substantially constant.

IN THE CLAIMS

1. (Amended) A method of reducing the effects of varying environmental conditions[, such as varying temperature,]on [the measuring results in] a measuring instrument[, wherein the measuring instrument comprises] comprising a measuring unit [(20) with components which are sensitive to varying environmental conditions,

characterized in that] said method comprising:

(a) the measuring unit (20) is] thermally [insulated] insulating said measuring unit such that the effects of variations [in the] of environmental conditions on [sensitive] selected components of said measuring unit are substantially reduced, [but] while allowing dissipated heat generated within [the] said measuring unit [can still] to leave [the] said measuring unit ; and

(b) the] controlling a first temperature in [the] said measuring unit [(20) is controlled] by means of a control loop comprising a temperature sensor [(37)] and means to influence [the] said first temperature in [the] said

measuring unit in such a way that [the] temperatures at locations with [sensitive] selected components are kept substantially constant.

2. (Amended) Method as in claim 1, wherein [the] said step of [thermal insulation (step a))] thermally insulating comprises arranging a thermal barrier [(41)] between [the] said measuring unit [(20)] and [the] a housing [(40)] of [the] said measuring instrument.

3. (Amended) Method as in claim 1 [or 2], wherein [the target] said first temperature in [the] said measuring unit [(20)] is related to [the] an ambient temperature and wherein [the] said first temperature is [range to be] controlled [is in] within a range of the order of the expected variation of the ambient temperature.

4. (Amended) Method as in claim 3, wherein [the target] said first temperature in [the] said measuring unit [(20)] is above [the] said ambient temperature[, for example by about one half of the expected variation of the ambient temperature].

5. (Amended) Method as in [any of the preceding claims] claim 1, wherein [the] said step of controlling [of the] a first temperature [in the measuring unit (step b))] comprises:

[providing a fan (34) for] directing air to [the] said measuring unit [(20)] utilizing a fan;

[and a heater (36) for] heating [the] said air directed to [the] said measuring unit [(20) by the fan]; and

measuring the temperature of [the] said heated air and using [this] said measured temperature as an input signal to [the] said control loop.

6. (Amended) Method as in claim 5, comprising the additional steps of:

measuring [the] a temperature (η_{amb}) close to [the] said housing [of the measuring instrument] where ambient air enters [the] said measuring instrument; and

deriving from [this] said temperature ~~(n-amb)~~ an additional input signal [(46)] to [the] said control loop.

7. (Amended) Method as in [any of the preceding claims] claim 1, wherein [the] said measuring instrument [is] comprises a liquid chromatography detector[, in particular a liquid chromatography absorbance detector].

8. (Amended) A measuring instrument[, for example an optical detector,] comprising a measuring unit [(20) with] comprising components which are sensitive to varying environmental conditions[, such as varying temperature,

characterized in that for reducing the effects of varying environmental conditions,] said measuring instrument comprising:

(a) a thermal insulation [means (41) is provided] arranged in [the] said measuring instrument [which] so as to substantially reduces the effects of said variations in [the] environmental conditions on [sensitive] selected components, [but still permits] and to permit dissipated heat generated within [the] said measuring unit to leave [the] said measuring unit ; and

(b) control means] a controller [are provided] for controlling [the] a first temperature in [the] said measuring unit [(20), wherein the control means comprise] , said controller comprising:

a temperature sensor [(37)] ; and

means to influence [the temperature in the measuring unit] said first temperature in such a way that [the] temperatures at locations with [sensitive] said selected components are kept substantially constant.

9. (Amended) Measuring instrument as in claim 8, wherein [the] said thermal insulation [means is a] comprises a thermal barrier [(41)] arranged between [the] said measuring unit [(20)] and [the] a housing [(40)] of [the] said measuring instrument.

10. (Amended) Measuring instrument as in claim 8 [or 9], wherein [the control means comprise] said controller comprises:

a fan [(34)] for directing air to [the] said measuring unit [(20),] ;

a heater [(36)] for heating [the air] said directed air [to the measuring unit (20) by the fan,] ;

a temperature sensor [(37)] for measuring [the] a temperature of [the] said heated air[,] ; and

a control loop connected to [the] said temperature sensor [(37)] and to [the] said heater [(36)].

11. (Amended) Measuring instrument as in claim 10, [wherein] further comprising an additional temperature sensor [(38) is provided] located in close proximity to [the] said housing [(40) of the measuring instrument] where ambient air enters [the] said measuring instrument, and wherein [the temperature measured with the] said additional temperature sensor [(37) is] provides an additional input signal to said control loop.

12. (Amended) Measuring instrument as in [any of the claims 8 to 11] claim 8, wherein [the] said measuring unit comprises :

a flow cell [(21)] through which solvent can flow[, for example solvent from a liquid chromatograph, characterized in that] ; and

additional means [are provided] for adapting [the] a solvent inlet temperature to [the] a temperature of the flow cell environment.

Please add the following new claims:

13. (Newly added) Method as in claim 3, wherein said first temperature is above said ambient temperature by about one half of said expected variation of said ambient temperature.

14. (Newly added) Method as in claim 1, wherein said measuring instrument comprises a liquid chromatography absorbance detector.

15. (Newly added) The measuring instrument of claim 8, wherein said measuring instrument comprises an optical detector.

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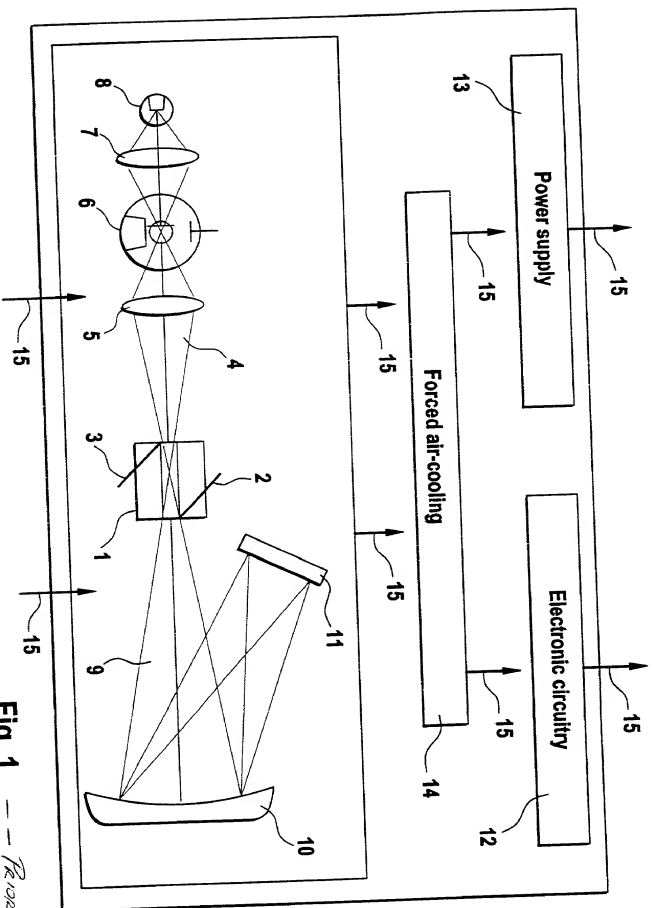


Fig. 1 -- Prior Art --